

PROGRAM facts

Strategic Center for Natural Gas

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U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY



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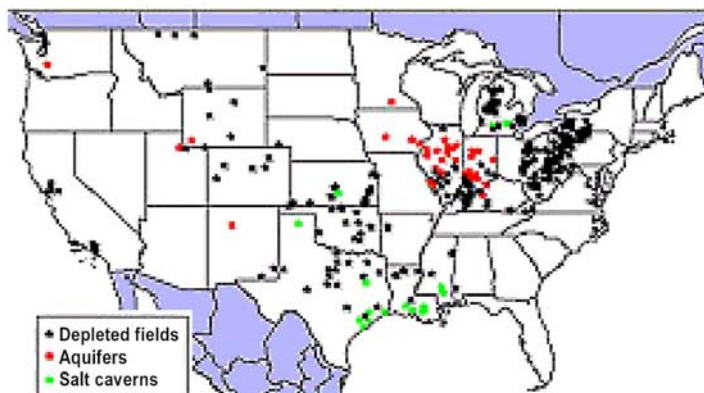
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NATURAL GAS STORAGE

The consumption of natural gas varies day to day and month to month. Weather and the demands of electric power generation translate into usage fluctuations. Seasonally the fluctuation is as much as 50% and in the short term it can be even more variable. Exact timing, location and volume of peak demand are unpredictable. Since natural gas is not produced in a way that corresponds to these fluctuations, surplus gas is pumped during slumps in usage into numerous storage facilities for use during inevitable surges in consumption. This allows continuous service even when production or pipeline transportation services can not meet demand.

The natural gas storage system serves the market place in several ways. Most importantly, it allows consistent delivery of the natural gas resource to consumers. Second, it stabilizes supply by sustaining production levels in the summer and eliminating shortages in the winter. Third, it eliminates the need for expensive, additional pipeline transmission capacity that would be necessary to supply peak demand. Finally, it provides confidence in and encourages the use of an environmentally friendly, clean burning fossil fuel.

To enhance the more than 1.3 million miles of pipelines, natural gas is stored in two basic ways – in tanks as liquefied natural gas (LNG) or in large underground storage facilities such as depleted gas/oil reservoirs, salt caverns, and aquifers. By far the greatest volume of gas is stored by this second method, mainly in depleted gas fields. Each year, from April to November, operators inject excess summer production into approximately 410 storage reservoirs across the country most of which are located near major eastern and mid-continent markets. They account for almost 4 trillion cubic feet of storage capacity, or nearly 20% of one year's national gas consumption.



Natural Gas Storage Facilities in the United States



CUSTOMER SERVICE

1-800-553-7681

WEBSITE

www.netl.doe.gov

STRATEGIC CENTER FOR NATURAL GAS WEBSITE

www.netl.doe.gov/scng

The natural gas storage industry faces difficult technological challenges as increased demand, demographics, and deterioration burdens our present storage system. There will be a significant shift in consumption patterns as population centers change and more natural gas is utilized in the production of electricity for summer air conditioning. Present storage wells must be renewed or replaced as older storage areas experience “wear” due to the yearly cycles of injection and extraction of gas.

To address these challenges, the goal of the Natural Gas Storage Program is to enhance the operational flexibility of the nation’s gas storage system while ensuring the integrity, operational reliability, safety and security of the nation’s entire natural gas infrastructure. Based on a collaborative approach to identify priorities and opportunities for research and development (R&D) funding, projects supported by DOE are developing technologies to ensure the availability of clean, affordable energy for our homes, businesses, and industries.

Current technology development efforts include:

- A newly established Gas Storage Consortium will provide a means to accomplish industry-driven R&D designed to enhance efficiency and deliverability from gas storage facilities.
- Development of improved gas metering technologies to provide increased accuracy and operational efficiency, and to enable existing flow meters to determine energy flow rate.
- Advanced storage technologies that will provide flexible storage service to meet the needs of new and growing industrial and power generation markets in areas without conventional storage geology. Examples include:
 - creating cavernous storage in carbonate rocks using a novel acid dissolution process
 - gas storage as hydrates

